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(21) International Application Number: PCT/FI96/00410 (22) International Filing Date: 11 July 1996 (11.07.96) (30) Priority Data: 953394 11 July 1995 (11.07.95) FI (71)(72) Applicant and Inventor: ULLAKKO, Kari, Martti [FI/FI]; Pihlajatie 3 C, FIN-02270 Espoo (FI). (74) Agent: LAITINEN, Pauli, S.; Patentti-Laitinen Oy, P.O. Box 29, FIN-02771 Espoo (FI).		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>																																				
(54) Title: A METHOD FOR PRODUCING MOTION AND FORCE BY CONTROLLING THE TWIN STRUCTURE ORIENTATION OF A MATERIAL AND ITS USES																																						
(57) Abstract The present invention refers to a method for obtaining shape changes, motion and/or force in a material having a twinned structure. According to the method, a sufficiently high external magnetic field applied to the material reorients the twin structure thereby producing motion/force. The operation is possible if the magnetocrystalline anisotropy energy is higher than or comparable to the energy of the reorientation of the twin structure to produce a certain strain.																																						
<table border="1"> <caption>Approximate data points from the Stress vs Strain graph</caption> <thead> <tr> <th>Strain (%)</th> <th>Cu-Zn (MPa)</th> <th>Cu-Zn-Sn (MPa)</th> <th>Ni-Mn-Ga (MPa)</th> <th>In-Tl (MPa)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>32</td> <td>18</td> <td>10</td> <td>2</td> </tr> <tr> <td>2</td> <td>38</td> <td>22</td> <td>13</td> <td>3</td> </tr> <tr> <td>3</td> <td>42</td> <td>25</td> <td>16</td> <td>4</td> </tr> <tr> <td>4</td> <td>48</td> <td>30</td> <td>20</td> <td>5</td> </tr> <tr> <td>5</td> <td>52</td> <td>35</td> <td>25</td> <td>6</td> </tr> </tbody> </table>				Strain (%)	Cu-Zn (MPa)	Cu-Zn-Sn (MPa)	Ni-Mn-Ga (MPa)	In-Tl (MPa)	0	0	0	0	0	1	32	18	10	2	2	38	22	13	3	3	42	25	16	4	4	48	30	20	5	5	52	35	25	6
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